

**September 16, 2008, Keynote by Vice Chair James D. Boyd
California Energy Commission before the California Pollution
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**"The Future is Green: A California Perspective on Renewable
Energy and Alternative Fuels"**

It's my great pleasure to be with you today to talk about a subject near and dear to my heart---the intersection between energy and air quality as the bridge to a green future for California. As a former air regulator and now an Energy Commissioner, I have long realized the need to balance multiple and often competing state policy goals.

Let me begin by emphasizing that there are four major policy drivers which influence the choice of California's energy supplies: the need to improve our state's air quality, fuel diversity to achieve price stability, national energy security especially in the wake of 911, and now global climate change---the biggest policy driver of all. Global climate change has presented us the most important economic and environmental challenge of the century.

The State of California has been a national leader in renewable energy development, starting from its peak during the early 1990s. With California's move to a deregulated electricity market, renewable power sources were seen as a means of reducing the costs and risks associated with high and volatile natural gas prices. Renewable power can provide the environmental benefits of reducing combustion of fossil fuels, while reducing our state's dependence on more polluting, out-of-state sources of electricity, for example, coal.

California currently has a mandate to increase the use of renewable energy to 20 percent of retail electricity sales by 2020. Most recently, in the Energy Commission's *2007 Integrated Energy Policy Report*, and dating back to 2003, the Energy Commission has advocated an increase in the State Renewable Portfolio Standard to 33 percent by 2020, a goal which is endorsed by our Governor and the California Public Utilities Commission as well.

With the passage of Assembly Bill 32, the Global Warming Solutions Act of 2006, the Air Resources Board has identified a 33 percent RPS as a key strategy for meeting our state's aggressive greenhouse gas (GHG) reduction targets.

While much progress has been made toward achieving our state's renewable energy goals, I believe that much more needs to be done. To meet the Governor's 2050 goal of reducing GHG emissions below 1990 levels by 80 percent, California may need to broaden its focus to include even higher levels of renewable energy and alternative and renewable transportation fuels.

As an important first step, the Energy Commission is working with stakeholders to identify key barriers to renewable and alternative energy development. For example, a primary barrier to increased development of renewable electricity continues to be the lack of adequate transmission to access these resources, which are often far from the load centers. To address this barrier, we formed the Renewable Energy Transmission Initiative (RETI) to facilitate and coordinate the planning and permitting of transmission and renewable generation.

In addition, through our Public Interest Energy Research (PIER) program, which is funded by a surcharge on electricity and natural gas rates, we are investing in emerging technologies that can enable renewable energy development. New technology can not only increase the carrying capacity of existing transmission lines, but also provide real-time information to grid operators and consumers to better manage the electricity grid. In addition, "smart grid" technology can improve overall efficiency, increase system reliability, reduce costs, and enhance two-way communication and grid control.

There is also the potential for large-scale use of renewable generation at the local distribution level. For example, community-scale photovoltaic installations or small wind generation can be attractive options. Solar thermal water heating and geothermal ground source heat pumps can offset electricity loads while reducing emissions of criteria pollutants and greenhouse gases. Research has suggested opportunities for small-scale renewable power combined with next generation, energy efficiency in "net zero" energy buildings.

Key barriers to renewable energy development include the potential for contract delays, contract cancellations, and regulatory and environmental permitting issues. Many of these same issues will affect the large and growing number of solar thermal power plants being proposed for the southern California desert region.

We need to consider the cost implications of moving to a 33 percent RPS. There is considerable price uncertainty in forecasting future electricity rates, since renewable energy projects are highly dependent on the future price of natural gas. In addition, major new investments will be needed in electricity transmission infrastructure, as the demand for electricity in California increases with population growth, which will increase electricity costs and rates.

A final overarching issue is what role the publicly owned utilities should play in meeting the state's renewable energy goals. Publicly and municipal owned utilities provide 25 to 30 percent of the retail electricity sold in California today. Their role in achieving the State RPS is critical to achieving our air quality and climate goals as well. We need to rely on these utilities to achieve the higher levels of renewable power needed to satisfy our AB 32 commitments.

The State of California and the California Energy Commission in particular, have advocated fuel diversity and a portfolio approach in the transportation sector as well. Our Governor has made his views on fuel diversity very clear, when he issued his Executive Order on Bioenergy on April 25, 2006, stating: "It is critical that we do everything we can to reduce our dependence on petroleum based fuels."

During the 2005 legislative session Governor Schwarzenegger signed into law state legislation, Assembly Bill 1007, calling upon the California Energy Commission, working in partnership with the California Air Resources Board, to develop a State Plan to increase the use of alternative fuels. The Energy Commission and the Air Resources Board approved the Plan in October 2007. This Plan provides a "blueprint" for moving forward to increase California's share of alternative and low carbon fuels.

In the final days of the 2007 legislative session, the Governor signed a landmark bill, which appropriates over \$200 million per year for an Air Quality Improvement Program, to be administered by the ARB (about \$80 million per year), and an Alternative and Renewable Fuel and Vehicle Program (approximately \$120 million per year) to be administered by the Energy Commission.

Working together, our two agencies are very well positioned to move forward with the needed state incentives for alternative fuels and vehicles. We are in the process of development an Investment Plan and enabling regulations to put his program in place by the second quarter of 2009.

The Governor's support of these two important pieces of legislation further demonstrates his commitment to pursue alternatives to petroleum. Despite our best efforts, however, both our state and our nation remain almost totally dependent on petroleum-based fuels for our transportation energy needs.

At a time when oil prices surpassed \$140 per barrel in recent months, the United States is consuming over 20 million barrels of oil each day; 68 percent is used in the transportation sector. In 2007, the U. S. will consume roughly 140 billion gallons of gasoline and approximately 70 billion gallons of diesel fuel. This year alone the nation will spend over \$340 billion importing oil, getting dangerously close to \$1 billion per day.

There is a growing recognition that oil is a finite resource, that global oil production is nearing its peak, and that the demand for petroleum in the developing world will surpass the demand in the developed world within the next three years. Since current demand for finished fuel consistently outstrips the supply, the price of petroleum fuels to the state's consumers has spiked. These factors give us a sense of urgency in addressing our nation's petroleum dependence.

Today, California as a state continues to be over 95 percent dependent on petroleum fuels, consuming over sixteen billion gallons of gasoline and over 4 billion gallons of diesel fuels each year. California is the third largest gasoline consumer in the world, second

only to the U. S. as a whole and China. In California, the transportation sector is also the single largest source of greenhouse gases, approaching 40 percent of the statewide total emissions. In response to the Governor's direction, we are embarking on series of joint efforts with the ARB recommending:

- Alternative fuel goals, to be measured on a gasoline gallon equivalent basis, for the years 2012, 2017 and 2022.
 - 9 percent in 2012
 - 11 percent in 2017
 - 26 percent in 2022
- A continuing examination of the costs and benefits of alternative fuels and vehicle technologies, using the same "full fuel cycle" approach that was used in the Alternative Fuels Plan.
- Administering the needed state incentives with funding from Assembly Bill 118 to spur the commercial development of advanced fuels and vehicle technologies.

With the signing of AB 118 funding legislation, California is now well positioned to move forward aggressively to advance our petroleum reduction, climate change, and air quality goals for the transportation sector.

On a parallel path, we are committed to fostering alternative fuels, fueling infrastructure and advanced technologies through our state RD&D programs. The State of California will embark on several new initiatives this year to fund transportation-related research, development and demonstration (RD&D) projects for clean fuels and vehicles. One notable example is the creation of a Plug-In Hybrid Center at the University of California at Davis by the Energy Commission to support the commercial development of this promising vehicle technology.

Furthermore, we are using PIER funds to successfully demonstrate and deploy clean fuels and advanced engines that will not only reduce petroleum consumption but also reduce

harmful emissions which are now impacting communities adjacent to the ports.

Through the Energy Commission's Public Interest Energy Research (PIER) program, we are spending up to \$9 million this year and will spend up to \$11 million next year for transportation RD&D. Our new funding legislation also earmarks an additional \$10 million per year for alternative fuels RD&D, with emphasis on "demonstration and deployment" of innovative fuels and vehicle technologies.

One key question remains: Which fuels and vehicle technologies show the most promise for likely success during the post-2010 timeframe? The short answer is: There is no silver bullet. No single fuel or vehicle technology has all of the desirable attributes which consumers want and need. There are often price and performance tradeoffs.

The success of most alternative fuels in both the light- and heavy-duty markets continue to be driven by three factors: the convenience of fueling infrastructure, vehicle performance, and relative price to the consumer (when compared to vehicles which operate on gasoline and diesel fuels).

We see the future of biofuels as a bright one, especially when waste streams can be effectively used to produce these fuels domestically. We have only to note the significant investment of major oil companies and private venture capitalists in new fuel formulations, in response to California's Low Carbon Fuel Standard. Also, there is considerable national attention being placed on renewable transportation fuels through national RD&D priorities and the national Renewable Fuel Standard.

At the same time, we are very mindful of the debate surrounding "food versus fuel" competition and the issues surrounding the sustainable production and use of biofuels. Using our waste streams, such as field wastes, orchard pruning, dairy manure, food processing wastes, forest debris, and urban green wastes as a source of fuel production, avoids this issue.

Dairy manure can be used to produce biomethane in the form of biogas, reducing emissions of methane, a global warming gas which is 23 times more powerful than carbon dioxide. Harnessing biogas from dairies and injecting it into our natural gas pipelines allows utilities to obtain credit toward meeting their RPS commitments. Use of biogas from dairies for onsite electricity generation is being pursued by some of our dairies but meeting stringent emission control requirements presents some daunting challenges.

It is important to address land conversion effects on agriculture, including impacts on water consumption and fertilizer use, and carbon releases from soil disturbance, in measuring the environmental impacts of emerging biofuels produced from energy crops. The importance of a “full fuel cycle” analysis cannot be overstated.

In signing his Executive Order on Bioenergy in April 2006, our Governor challenged state agencies to promote the sustainable development of our state’s biomass resources. The Bioenergy Interagency Working Group, which I chair, is working to develop a clear and consistent state policy to address regulatory uncertainty and to improve the economics of bioenergy projects (biopower, biogas and biofuels). To quote Governor Schwarzenegger: “Turning waste products into energy is good for the economy, local job creation and our environment.”

In California, blending ethanol by up to ten percent by volume is allowed for meeting state fuel specifications. There is growing interest in blending biodiesel and renewable diesels, in the form of B-5, B-10 and B-20 blends, into diesel fuel. Substantial amounts of private risk capital are being directed toward building biofuels production facilities in California. We view these blends as important “supply enhancers” as we continue to face limits on our state’s refining capacity.

In conclusion, the State of California will continue to be a powerful force for change in its pursuit of clean, green technology. Our charge remains clear: California will continue to have a “green future” if we move forward together to support clean fuels and technologies that will drive our economy and benefit our environment.